Applicant : Wei Zhu et al.   Attorney's Docket No.: 20296-0002US1 / OP050050;
Serial No. : 10/565,352   Huawei Ref.: 0310882US
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Amendments to the Claims:

This listing of claims replaces all prior versions and listings of claims in the application:

Listing of Claims:

1. (Currently amended) A Multi-Protocol Label Switch (MPLS) processing method applied in a multi-port Virtual Local Area Network (VLAN), wherein the VLAN includes a node with a MPLS table item managing module and the method comprises steps of:

establishing a label switch path (LSP), by the node in the multi-port VLAN, through a label distribution protocol (LDP), and obtaining information binding a forwarding equivalence class (FEC) and a label or information binding an ingress label and an egress label, and an address of a LDP peer entity at an opposite end, which is a next-hop IP address;

creating, by the MPLS table item managing module, a forwarding-relation table, and adding a forwarding-relation table item based upon the obtained information;

obtaining, by the MPLS table item managing module, a specific egress port corresponding to the forwarding-relation table item from the multiple ports of the VLAN based upon the next-hop IP address; and

accomplishing, by the node in the multi-port VLAN, the MPLS via the specific egress port.

2. (Original) The method according to claim 1, wherein the step of the MPLS table item managing module creating the forwarding-relation table and adding the forwarding-relation table item based upon the obtained information further comprises steps of:

creating a forwarding-relation table item of FTN for a label edge router (LER) in the VLAN, which indicates a mapping of a forwarding equivalence class (FEC) to a next-hop label forwarding entry (NHLFE); and

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creating an forwarding-relation table item of Incoming Label Map (ILM) for a label switch router (LSR) in the VLAN, wherein the forwarding-relation table item of ILM indicates a mapping of an input label to the NHLFE.

3. (Original) The method according to claim 1, wherein the step of obtaining the egress port corresponding to the forwarding-relation table item based upon the next-hop IP address further comprises steps of:

the MPLS table item managing module searching an address resolution protocol (ARP) table based upon the next-hop IP address to judge whether there is a corresponding table item of ARP;

if there is a corresponding table item of ARP, establishing a correspondence relation of the forwarding-relation table item and a corresponding egress port and physical MAC address in the table item of ARP based upon information of the corresponding egress port and MAC address; and

if there is no corresponding table item of ARP, marking the forwarding-relation table item with an UNAVAILABLE sign, and obtaining information of the egress port with a data flow which triggers a corresponding action based upon an actual data flow.

4. (Original) The method according to claim 3, wherein the step of obtaining the information of the egress port with the data flow if there is no corresponding table item of ARP further comprises steps of:

transmitting an ARP broadcast request in the VLAN based upon the next-hop IP address and an egress interface VLAN;

receiving an ARP response message sent from the opposite end;

relearning and obtaining the egress port and MAC address corresponding to the next-hop IP address based upon the received ARP response message sent from the opposite end; and

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a maintaining and managing module of the VLAN notifying the MPLS table item managing module to update the information of the egress port corresponding to the forwarding-relation table item based upon the received ARP information.

5. (Original) The method according to claim 1, wherein further comprising steps of:

the MPLS table item managing module distributing the relevant forwarding-relation table item to the maintaining and managing module to create the forwarding-relation table maintained by the maintaining and managing module; and

the maintaining and managing module maintaining a correspondence relation of the next-hop IP address and the forwarding-relation table item.

6. (Original) The method according to claim 5, wherein the step of the MPLS table item managing module distributing the relevant forwarding-relation table item to the maintaining and managing module further comprises steps of:

for the LER in the VLAN, the MPLS table item managing module sending the information of the forwarding-relation table item of FTN to the maintaining and managing module; and

for the LSR in the VLAN, the MPLS table item managing module sending the information of the forwarding-relation table item of ILM to the maintaining and managing module.

7. (Original) The method according to claim 5, wherein the step of the maintaining and managing module maintaining the correspondence relation of the next-hop IP address and the forwarding-relation table item further comprises steps of:

when an ARP is deleted, the maintaining and managing module notifying the MPLS table item managing module to update the forwarding-relation table item related to the ARP; and

setting an INVALID flag bit for the forwarding-relation table item related to the ARP.

8. (Original) The method according to claim 7, wherein the step of setting the INVALID flag bit for the forwarding-relation table item related to the ARP further comprises steps of:

in a distributed forwarding system, notifying micro-codes to set the INVALID flag bit for the forwarding-relation table item in the micro-codes which is related to the ARP; and

in a non-distributed forwarding system, the MPLS table item managing module setting the INVALID flag bit for the forwarding-relation table item which is related to the ARP.

9. (Original) The method according to claim 5, wherein the step of the maintaining and managing module maintaining the correspondence relation of the next-hop IP address and the forwarding-relation table item further comprises steps of:

when an ARP is newly created, the maintaining and managing module searching the forwarding-relation table maintained by itself as to whether there is a table item related to the ARP;

if not, no process being performed, otherwise judging whether a new egress port is consistent with the egress port corresponding to the original forwarding-relation table item; and

if consistent, maintaining the original forwarding-relation table item, otherwise notifying the MPLS table item managing module to update the information of the egress port corresponding to the forwarding-relation table item.

10. (Original) The method according to claim 1, wherein in a distributed forwarding system, the method further comprises a step of converting the forwarding-relation table item created by the MPLS table item managing module into a format required by micro-codes and distributing the forwarding-relation table item to the micro-codes 1.